



## BACKGROUND OF THE INVENTION

The present invention relates to an instrument for periodontal treatment, and more particularly, to an instrument which permits ~~permitting~~ scaling and root surface treatment for the purpose of cleaning [[the]] periodontal pockets.

Instruments of this type, such as ~~Such instruments~~ ~~consisting of~~ manual curettes, or [[of]] inserts mounted on vibratory handpieces, are already known ~~at present~~. However, the rigidity of the known ~~existing~~ instruments does not permit treatment of the periodontal pockets, or satisfactory cleaning of the furcations, thereby [[thus]] forcing the practitioner to use ~~practice~~ traditional methods of periodontal surgery involving the cutting of flaps.

An instrument which has made ~~with which~~ it [[is]] possible to overcome the aforementioned disadvantages is also known, in particular, from ~~the patent~~ EP 0 715 508 B1 ~~filed by the present Applicant~~. The disclosed [[This]] instrument comprises a shank and a blade. The blade [[;]] ~~the latter~~ has an active part with two sectors distributed along the blade, [[and]] each of which is situated on either side of a plane passing through the axis of the blade, and the [[.]] ~~These~~ two sectors have different levels of aggressiveness. As a [[,]]

~~with the~~ result ~~[[that]]~~, during treatment and ~~[[,]]~~ with the instrument introduced into the periodontal pocket, the more aggressive sector comes into contact with the root surface of the tooth, and the less aggressive sector comes into contact with the mucosa. The ~~[[Said]]~~ blade is held, by way of its shank, on a handpiece which imparts a vibratory movement to the blade ~~[[it]]~~ in order to allow both sectors to detach ~~[[the]]~~ tartar to be removed.

Although the disclosed ~~such an~~ instrument is satisfactory, it continues to be the subject of refinements for aimed at improving the comfort for both the patient and the practitioner ~~alike~~.

#### SUMMARY OF THE INVENTION

To this end, and in accordance with ~~the subject of~~ the present invention, ~~[[is]]~~ an instrument for periodontal treatment is provided which comprises ~~[[,]] comprising~~ a blade ~~connected~~ integrally connected to a head for coupling the blade ~~intended to be coupled~~ to a handpiece so as to impart ~~to said blade~~ a vibratory movement to the blade. An active part is distributed along the blade on a side of the ~~[[, said]]~~ blade which is defined having, ~~on one of the sides delimited~~ by a plane passing through the ~~[[its]]~~ axis of the blade. The ~~[[,]] an active part~~

~~distributed along the blade, characterized in that said blade is~~  
additionally provided with an irrigation channel for liquid,  
arranged at the [[its]] center of the blade. The ~~[[, this]]~~  
channel opens ~~opening~~ out at the center of the active part of  
the [[said]] blade, along the major part of its length, to ensure  
~~thus ensuring,~~ on the one hand, cleaning of the active part of  
the tool during a [[the]] procedure [[,]] and, on the other hand,  
removal of the detached particles.

In accordance with ~~According to an advantageous~~  
~~characteristic of~~ the present invention, the [[said]] blade  
is advantageously provided with a plane which intersects  
~~intersecting~~ with the [[said]] channel, ~~thereby and thus~~  
providing an [[the]] opening for [[of]] the channel on the active  
part. ~~The intersecting [[,]] and this plane of intersection is~~  
inclined with respect to the axis of the blade and defines the  
active part of the blade. ~~A on which is arranged, on each side~~  
~~of the opening of the channel, a plurality of notches, or some~~  
~~[[any]] other similar configuration, is arranged on each side~~  
of the opening of the channel to provide ~~affording~~ a surface  
roughness which is adequate for ~~[[its]] use of the blade.~~

Various alternative embodiments of the instrument  
of the present invention can be provided.

~~For example, in one alternative~~ According to one embodiment ~~variant~~, the end of the blade has a ~~curvature~~.

~~According to curvature.~~ In another ~~alternative~~ embodiment ~~variant~~, the end of the blade ~~can is able to~~ be curved by the practitioner for adapting the blade ~~[[it]]~~ to the particular treatment which is being performed ~~ease being treated~~, for example, for access to the furcations.

~~Further in accordance with~~ ~~Still according to~~ the present invention, the blade is mounted on the head in an articulated manner ~~on said head~~, for example, by means of a hinge of the ball-and-socket type. This allows ~~[[,]] thus affording the possibility of orienting~~ the position of the active part of the blade to be oriented with respect to the grip of the apparatus.

~~In another alternative~~ According to an embodiment ~~variant~~, the end remote from the active ~~[[free]]~~ part of the ~~[[said]]~~ blade is provided with a means for detachable fixation to the head of the instrument. For example, such ~~[[.]]~~

~~According to one embodiment, this means for~~ detachable fixation of the blade can be accomplished with ~~comprises~~ a bushing which can be maneuvered, in particular, by the

practitioner. ~~The and on which the blade is then integrally~~  
~~connected on the bushing. The integrally, and this~~ bushing is  
additionally provided with an annular groove which, in ~~a the~~  
~~mounted position mounted~~ on the ~~[[said]]~~ head, forms a leak-tight  
annular chamber for communication between the irrigation channel  
of the blade and a delivery channel for liquid arranged on the  
head.

~~The According to another advantageous characteristic~~  
~~of the invention, said head is advantageously~~ provided with a  
channel for ~~the~~ delivery of liquid which is linked to the  
irrigation channel of the blade.

~~According to yet another advantageous characteristic~~  
~~of the invention, the blade. The entry point for [[of]] the~~  
liquid ~~can be~~ ~~[[is]]~~ external or internal to the handpiece.

The above-mentioned characteristics of the present  
invention, in addition to other characteristics which will become  
apparent to the person of ordinary skill and others too, are  
discussed in the detailed ~~will appear more clearly on reading the~~  
~~following~~ description of ~~[[an]] illustrative embodiments which is~~  
provided hereafter, with reference to the following attached  
drawings. ~~[[,]] in which:~~

### BRIEF DESCRIPTION OF THE DRAWINGS

[[ - ]] Figure 1 is a side view of an instrument of  
~~according to~~ the present invention. [[ , and ]]

[[ - ]] Figure 2 is a view similar to Figure 1,  
illustrating an alternative embodiment ~~variant~~ of the present  
invention.

### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1 shows ~~depicts~~ an instrument for dental surgery,  
in particular, an instrument for periodontal treatment. The  
illustrated instrument comprises [[ , ]] ~~comprising~~ a blade 1,  
which is also referred to ~~designated~~ as an insert, integrally  
connected ~~integrally~~ to a head 2. The head 2 [[ which ]] is  
~~coupled~~ removably and interchangeably coupled to a handpiece  
(not shown).

In ~~According to~~ the embodiment shown, the [[ said ]]  
blade 1 has a circular cross-section. An active part 1a of  
the blade 1 is distributed along a side of the blade which is  
defined and, ~~on one of the sides delimited~~ by a plane passing  
through the axis of the blade [[ , ]] ~~it has an active part 1a~~  
~~distributed along said blade.~~

The ~~[[This]]~~ active part 1a is made up of a plurality of notches 3 which project ~~projecting~~ from the blade and which are arranged on parallel planes, thereby ~~[[thus]]~~ giving the active part 1a ~~[[it]]~~ the desired surface roughness. Thus, during a treatment and ~~[[,]]~~ with the instrument introduced into a ~~[[the]]~~ periodontal pocket, the active part 1a of the blade 1, i.e., ~~(that is to say the part provided with a surface roughness,~~ ~~[[ ]]~~ comes into contact with the root surface of the tooth. An opposing ~~[[,]]~~ ~~and the other~~ part 1b of the blade (shown in Figure 2), i.e., a ~~that is to say the~~ less aggressive part or even a smooth part, comes into contact with the ~~mucosa.~~

~~It~~ mucosa. It will be noted that the parallel ~~[[these]]~~ planes can be inclined with respect to the plane which defines the active part 1a of the blade 1, perpendicular to the axis of the instrument, in order to ensure greater efficacy of the blade.

In accordance with ~~According to~~ the present invention, the ~~[[said]]~~ blade 1 is provided with an irrigation channel 4 for receiving a liquid. The channel 4 is arranged at the ~~[[its]]~~ center of the blade 1, and opens ~~this channel 4 opening~~ out at the center of the active part 1a of the ~~[[said]]~~ blade 1 along the major part of its length. This ensures, ~~thus ensuring,~~ on the one hand, cleaning of the active part of the tool during a

[[the]] procedure and, on the other hand, the removal of [[the]] detached particles, as is explained in greater detail below.

~~In According to~~ a preferred embodiment of the present invention, the blade 1 is provided with a plane 6 which intersects with the channel 4 in order to provide the opening 5 of the channel 4 on the active part 1a [[,]] ~~said blade 1 is provided with a plane 6 intersecting with said channel 4.~~ This plane of intersection 6 is advantageously inclined with respect to the axis of the blade 1 and defines the active part 1a of the blade 1. The previously described notches 3 (or other similar configuration) are ~~on which is~~ arranged [[,]] on each side of the opening 5 of the channel 4, ~~the plurality of notches 3 or any other similar configuration~~ providing a surface roughness adequate for [[its]] use of the instrument.

The end remote from the active [[free]] part of the [[said]] blade 1 is provided with a means for detachable fixation to the ~~head~~.

~~According to one head.~~ In the embodiment shown, such detachable this means of fixation is accomplished with composed ~~of~~ a bushing 7 which can be maneuvered, in particular, by the practitioner. The ~~and on which the~~ blade is integrally connected on the bushing 7 in order to allow the blade 1 [[it]] to be



detached from the head, thereby making the blade ~~and make it~~ interchangeable.

The ~~[[This]]~~ bushing 7 is additionally provided with an annular groove 8 which, when ~~[[in the]]~~ mounted ~~position~~ on the ~~[[said]]~~ head 2, forms an annular chamber 9. Sealing members 10, 11 are provided ~~rendered leaktight by the provision,~~ on either side of the ~~[[said]]~~ chamber 9, ~~of a sealing member 10 and 11,~~ as is illustrated in ~~Figure 1.~~

This Figure 1, for making the annular chamber 9 leak-tight. The annular chamber 9 provides ~~[[the]]~~ communication between the irrigation channel 4 of the blade 1 and a delivery channel 12 arranged on the head 2. The delivery channel 12 is provided for receiving a ~~[[for]]~~ liquid such as water, a disinfectant or any other product which is principally intended for irrigating ~~principally to irrigate the tissues during treatment.~~ It ~~[[,]] said delivery channel 12 being arranged on the head 2.~~

~~It~~ will be noted that the entry point of the liquid can ~~[[may]]~~ be external to the handpiece, as is illustrated in Figure 1, or internal to the handpiece (not shown).

The ~~[[Said]]~~ head 2 is ~~mounted~~ preferably mounted on an ultrasound-generating apparatus whose ultrasonic vibrations have intrinsic antibacterial properties. Also, by virtue of such ~~[[these]]~~ vibrations, the ~~[[said]]~~ blade 1 is able to reach and file the tooth ~~[[,]]~~ without damaging the residual connective tissue surrounding the tooth ~~[[it]]~~.

Use of ~~The way in which~~ the instrument of the present invention for performing periodontal treatments ~~according to the invention is used~~ will already be evident from the above description.

The description. The practitioner mounts the instrument onto a handpiece and connects the delivery channel 12 for receiving a desired liquid to an entry point. The ~~[[,]]~~ ~~then places the face of the active part 1a~~ is then placed in contact with the root surface of the ~~teeth~~.

~~The vibration tooth.~~ Vibration of the instrument then ~~[[thus]]~~ brings about a removal of the granulated tissue of the mucous wall of the periodontal alveolus, and surface treatment of the root. Direct irrigation on the blade 1, using ~~by way of~~ the channel 4, permits removal of the resulting debris, providing ~~and thus~~ better visibility of the site for the practitioner.

~~The~~ ~~It will be noted that the~~ end of the blade 1 can be pre-curved, or can be manually shaped by the practitioner, depending on the anatomy of the tooth to be treated. This [[,]] additionally makes ~~making~~ it possible to penetrate the pockets atraumatically, and ~~but also~~ to more effectively clean plane root surfaces inside larger alveoli.

It will be noted that the length of the blade 1 is similar to that of previously [[the]] known endodontic files, for example, on that is to say of the order of 12 to 25 mm in length and having [[with]] a thickness on [[of]] the order of 0.1 to 3.0 mm.

Figure 2 shows an alternative embodiment ~~variant~~ of the instrument for periodontal treatment shown in Figure 1. In the alternative embodiment of Figure 2, ~~in which~~ the bushing 7 does not pass through the [[said]] head 2, with ~~thus affording~~ the resulting advantage of reducing the number of sealing members to a single sealing member 13.

In yet another alternative ~~According to an~~ embodiment ~~variant not shown here,~~ the blade 1 of the instrument is mounted on the head in an articulated manner ~~on the head,~~ for example, by means of a hinge of the ball-and-socket type, as is schematically shown at 14. This affords [[,]] ~~thus affording~~ the possibility

of orienting the position of the active part of the blade with respect to the grip of the apparatus.

~~It~~ ~~From reading the above description, it~~ will be appreciated from the foregoing description that the instrument for periodontal treatment of ~~according to~~ the present invention is relatively simple to produce and permits treatment that is rapid and atraumatic for the patient. In addition, the ~~this is an~~ instrument [[which]] does not require a surgical intervention, in contrast to procedures with curettes which, for deep periodontal pockets, require the cutting of flaps.

Although the present invention has been described in connection with two particular embodiments, it will be understood that the present invention also includes all technical equivalents of the ~~means described.~~

~~Thus, for~~ described embodiments. For example, while the straight shape which has been described is considered optimal, the shape of the blade ~~which, instead of the optimal straight shape,~~ could instead be narrowed in the direction of the tip in order to adapt the blade for [[it to]] use inside gingival alveoli. Likewise, the blade [[1]] can have any suitable cross-section, ~~for example elliptic.~~

~~Likewise,~~ for example, an elliptical cross-section. It  
[[it]] will further be noted that the instrument for periodontal  
treatment of ~~according to~~ the present invention can [[may]], if  
appropriate, be disposable.